Instructions: Try these problems from the textbook as practice (answers below).

Problems

1-18. Evaluate the line integral.

3. $\displaystyle\int_C xy^4\ ds$, C is the right half of the circle $x^2+y^2=16$
7. $\displaystyle\int_C (x+2y)\ dx + x^2\ dy$, C consists of the line segments from $(0,0)$ to $(2,1)$ and from $(2,1)$ to $(3,0)$
11. $\displaystyle\int_C xe^{yz}\ ds$, C is the line segment from $(0,0,0)$ to $(1,2,3)$
15. $\displaystyle\int_C z^2\ dx + x^2\ dy + y^2\ dz$, C is the line segment from $(1,0,0)$ to $(4,1,2)$

21-24. Evaluate $\displaystyle\int_C \mathbf{F}\cdot d\mathbf{r}$, where C is given by the vector function $\mathbf{r}(t)$.

21. $\mathbf{F}(x,y,z) = xy^2\mathbf{i} + x^2\mathbf{j}, \mathbf{r}(t) = t^3\mathbf{i} - t^2\mathbf{j},\ 0\le t\le 1$
23. $\mathbf{F}(x,y,z) = \sin(x)\mathbf{i} + \cos(y)\mathbf{j} + xz\mathbf{k}, \mathbf{r}(t) = t^3\mathbf{i} - t^2\mathbf{j} + t\mathbf{k},\ 0\le t\le 1$

Answers

3. 1638.4
7. $\frac{5}{2}$
11. $\frac{1}{12}\sqrt{14}(e^6 - 1)$
15. $\frac{\pi}{2} - \frac{\sqrt{2}}{6}$
21. $\frac{1}{20}$
23. $\frac{6}{5} - \cos(1) - \sin(1)$